# CHAPTER 11 DESIGN CRITERIA

This section provides a description of the design criteria for the major features of the proposed ultimate roadway. Plan and profile sheets of the concept are provided in Chapter 15.

## 11.1 MAINLINE AND RAMP DESIGN CRITERIA

SR 303L will be designed to be a fully grade separated access-controlled highway. The design criteria used for the ultimate roadway mainline shall be the ADOT *Roadway Design Guidelines* and current ADOT *Construction Standard Drawings*, as summarized in Table 11-1. The typical section for the ultimate fully access-controlled highway is shown in Section 11.3 and in the plans provided in Chapter 15.

**Table 11-1 Design Criteria Summary – SR 303L Mainline**

| Description | SR 303L Mainline |
|---|---|
| Standard Typical Section: | See Section 11.3 |
| Design Year: | 2030 |
| Design Vehicle: | WB-67 |
| Design Speed: | 65 mph |
| Stopping Sight Distance Criteria: | 3.5 ft Eye Height<br>2.0 ft Object Height |
| Superelevation: | 0.06 ft/ft maximum |
| Maximum Horizontal Curve: | Per Horizontal SSD Requirements |
| Minimum Vertical Curve Length: | 800 ft |
| Maximum Gradient: | 3% |
| Travel Lane Width: | 12 ft |
| Inside Shoulder Width: | 8 ft + 2ft offset to barrier |
| Outside Shoulder Width: | 10 ft + 2ft offset to barrier |
| Minimum Recovery Area: | 30 ft |
| Normal Cross-Slope: | 0.02 ft/ft |
| Vertical Clearance: | 16.5 ft Over Roadways<br>16 ft to Falsework Over Traffic<br>23.5 ft Over railroads |
| Pavement Design Life: | 20 years |
| Barrier Type: | ADOT Std C-10.62 (32" Outside)<br>ADOT Std C-10.63 (42" Outside Over Traffic)<br>ADOT Std C-10.67 (42" Median) |
| Curb and Gutter Types: | ADOT Std C-05.10 |

As part of the ultimate roadway, service interchanges will be provided at the cross streets. The design criteria used for the SR 303L entrance and exit ramps shall be the ADOT *Roadway Design Guidelines* and ADOT *Construction Standard Drawings*, as summarized in Table 11-2. The typical section for ramps is shown in Section 11.3 and in the plans of Chapter 15.

**Table 11-2 Design Criteria Summary – Ramps**

| Description | Ramps |
|---|---|
| Standard Typical Section: | See Section 11.3 |
| Design Year: | 2030 |
| Design Vehicle: | WB-67 |
| Design Speed: | 55 mph (Entrance Ramp Gore Area)<br>60 mph (Exit Ramp Gore Area)<br>55 mph (System Ramp Body)<br>50 mph (Service Ramp Body)<br>35 mph (Intersection) |
| Stopping Sight Distance Criteria: | 3.5 ft Eye Height<br>2.0 ft Object Height |
| Superelevation: | 0.06 ft/ft maximum |
| Minimum Vertical Curve Length: | 400 ft |
| Maximum Gradient: | 4% Upgrade<br>5% Downgrade |
| Travel Lane Widths: | 12 ft |
| Inside Shoulder Width | 6 ft (One-Lane System Ramps-no offset to barrier)<br>4 ft (2-Lane System Ramps)<br>2 ft (Service Ramps)<br>add 2 ft offset to barrier (all ramps except one-lane system) |
| Outside Shoulder Width: | 10 ft (One-Lane System Ramps)<br>8 ft (2-Lane System Ramps)<br>8 ft (One-Lane Service Ramps)<br>2 ft (Multi-Lane Service Ramps)<br>add 2 ft offset to barrier (all ramps except one-lane system) |
| Minimum Clear Zone Width: | 30 ft |
| Vertical Clearance: | 16.5 ft Over Roadways<br>16 ft to Falsework Over Traffic |
| Pavement Design Life: | 20 years |
| Barrier Type: | ADOT Std C-10.63 (42") |
| Curb & Gutter Types: | ADOT Std C-05.10 |

## 11.2 CROSS STREET DESIGN CRITERIA

The cross streets at the connection points to SR 303L outside of the cities of Surprise and Goodyear will be designed as MCDOT urban principal or minor arterials. Within the cities of Surprise and Goodyear, the cross streets will have classifications as determined by the local general plan, as shown in Sections 11.3 and 12.5. The cross streets will be designed according to the criteria of the jurisdiction in which the street is located. In the absence of local design criteria, the latest revision of the MCDOT *Roadway Design Manual* will be used. Some common design criteria for all cross streets are summarized in Table 11-3.

**Table 11-3 Design Criteria Summary – Cross Streets**

| Description | Cross Street |
|---|---|
| Standard Typical Section: | See Sections 11.3 & 12.5 |
| Design Year: | 2030 |
| Design Vehicle: | WB-67 |
| Design Speed: | 45 mph at interchange |
| Stopping Sight Distance Criteria: | 3.5 ft Eye Height<br>2.0 ft Object Height |
| Superelevation | None |
| Maximum Gradient: | 6% |
| Clear Zone Width: | 1.5 ft min. (3 ft desirable) from curb face |
| Vertical Clearance: | 16.5 ft Over Roadways<br>16 ft to Falsework |
| Pavement Design Life: | 20 years |
| Curb & Gutter Types: | ADOT Std C-05.10 |

## 11.3 TYPICAL SECTIONS

### SR 303L Mainline

The ultimate SR 303L mainline typical section (Figure 11-1) will consist of four general purpose lanes and one HOV lane in each direction of travel, with the directions of travel being separated by a median concrete barrier. Between Thomas Road and Bell Road, where traffic interchanges are at one-mile intervals, auxiliary lanes will be constructed between the interchanges. North of Bell Road, parallel entrance and exit ramps will be constructed since interchange intervals are greater than one mile.

The initial freeway typical section for SR 303L (Figure 11-1) will consist of a 74-foot wide open median with three general purpose lanes in each direction of travel. Auxiliary lanes will be constructed in the same locations as the ultimate section. The lanes built in the initial freeway construction will be the outer-most lanes of the ultimate section. The intent is to provide a typical section in the initial construction that conforms to the MAG plan and allows for a cost-effective way to upgrade to the ultimate ten-lane section. By building the outside lanes first, the ramps, outside drainage, Freeway Management System (FMS), and lighting facilities are constructed in their ultimate locations and do not require relocation when the initial freeway is widened in the median to the ultimate section.

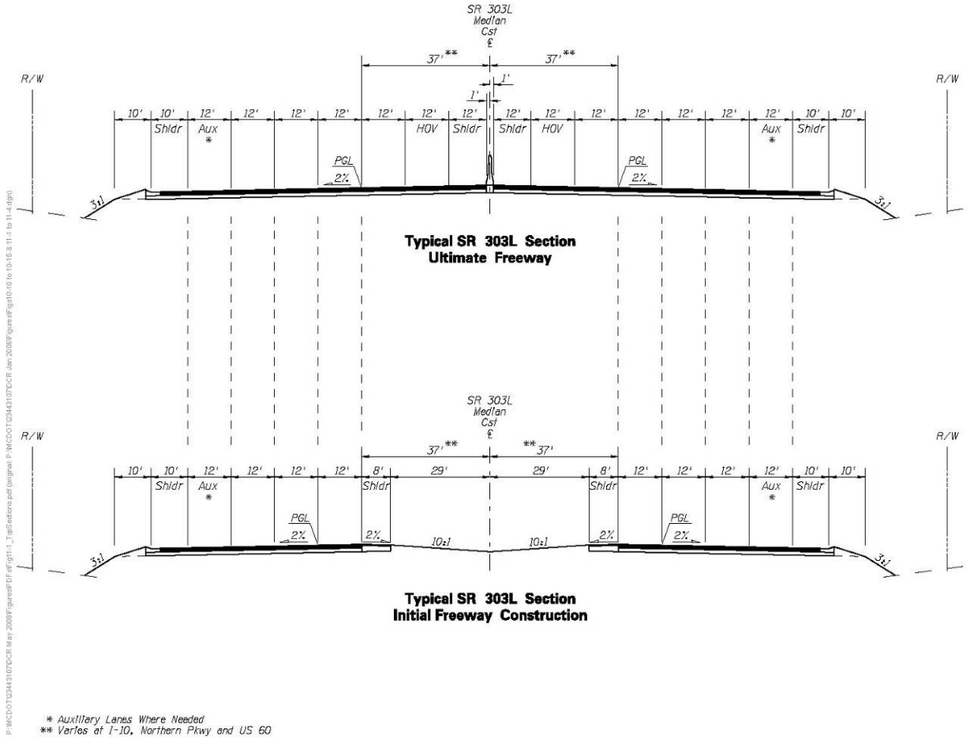



**Figure 11-1 SR 303L Typical Sections**

**Ramps and Frontage Roads**

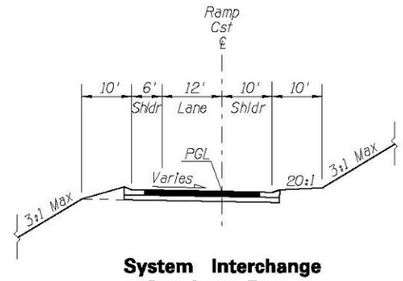
The entrance ramps at the traffic interchanges (Figure 11-2) will be ADOT standard and be 28 feet wide with two lanes, tapering to one lane near the gore. The exit ramps at the traffic interchanges will be ADOT standard one-lane exit ramps and be 22 feet wide with one 14-foot wide lane and an 8-foot wide outside shoulder.

The fully directional ramps (Figure 11-2) at the system interchanges at Northern Parkway and I-10 will follow ADOT standards as well. One-lane ramps will be 28 feet wide, consisting of a 6-foot inside shoulder, a 12-foot lane and a 10-foot outside shoulder. Two-lane ramps will be 36 feet wide, consisting of a 4-foot inside shoulder, two 12-foot lanes and an 8-foot outside shoulder. On two-lane ramps where shoulders are adjacent to half barrier or bridge parapet, an additional 2 feet shy distance shall be added to the shoulder width. As a result, two-lane ramps will be 40 feet wide on bridges and where half barrier is on both the inside and outside of the ramp. One-lane ramps do not require the extra 2 feet shy distance per ADOT standard.

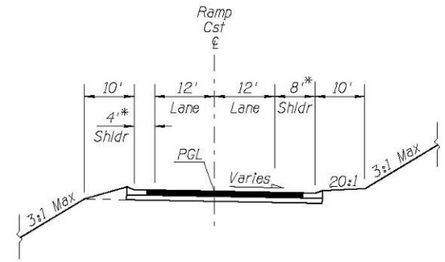
The frontage roads (Figure 11-2) will all be two-lane, one-way roadways consisting of 28-foot wide pavement and curb and gutter.

**Cross Streets**

The typical section of the cross streets vary depending on their classification and the jurisdiction in which the street is located. Generally, each cross street is classified as a “principal arterial” or a “minor arterial,” if the street is located in Surprise or under MCDOT jurisdiction. The corresponding classifications for streets in Goodyear are “major arterial” or “arterial,” respectively. Generally, the principal arterial has three through lanes in each direction with a raised median and sidewalk. The minor arterial has two lanes and a bike lane and either a raised or painted median and sidewalk. Figure 11-3 and Figure 11-4 shows the various typical sections of the principal and minor arterials. Section 12.5 details the classification of each cross street.

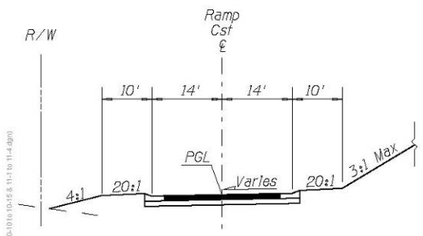



**System Interchange
One–Lane Ramp
Typical Section**

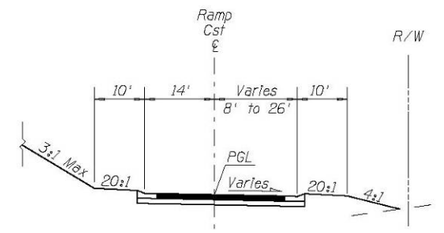



**System Interchange
Two–Lane Ramp
Typical Section**

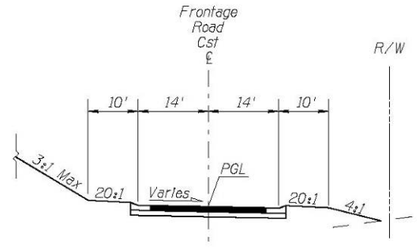
* Width Increases by 2'
When Adjacent to Half Barrier




**Service Interchange
Entrance Ramp
Typical Section**

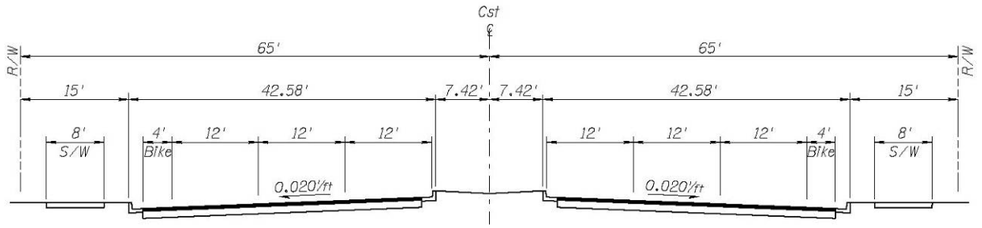



**Service Interchange
Exit Ramp
Typical Section**



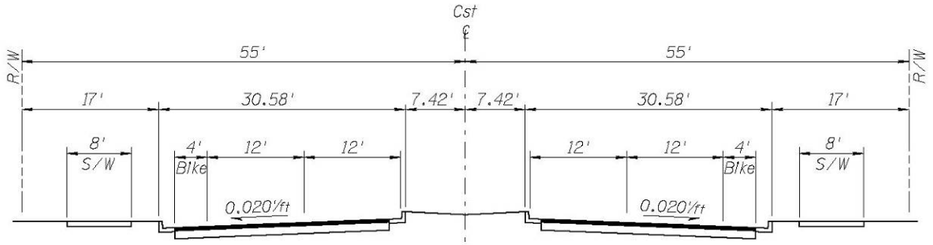

**Frontage Road
Typical Section**

**Figure 11-2 Ramp and Frontage Road Typical Sections**



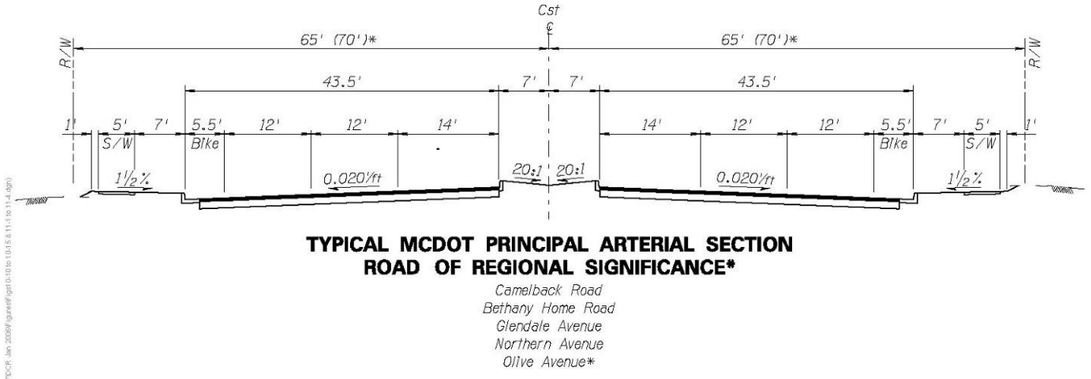

**TYPICAL CITY OF GOODYEAR MAJOR ARTERIAL SECTION**

*McDowell Road*
*Indian School Road*



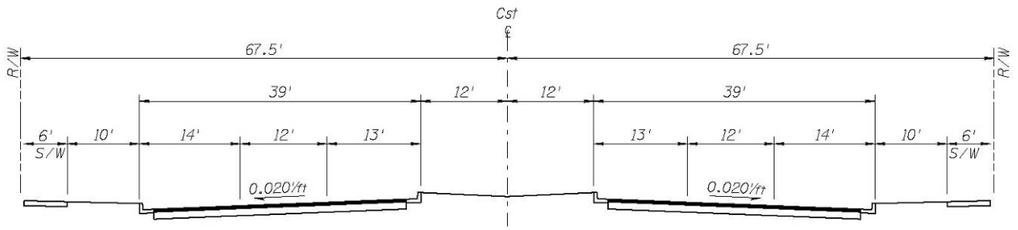

**TYPICAL CITY OF GOODYEAR ARTERIAL SECTION**

*Thomas Road*



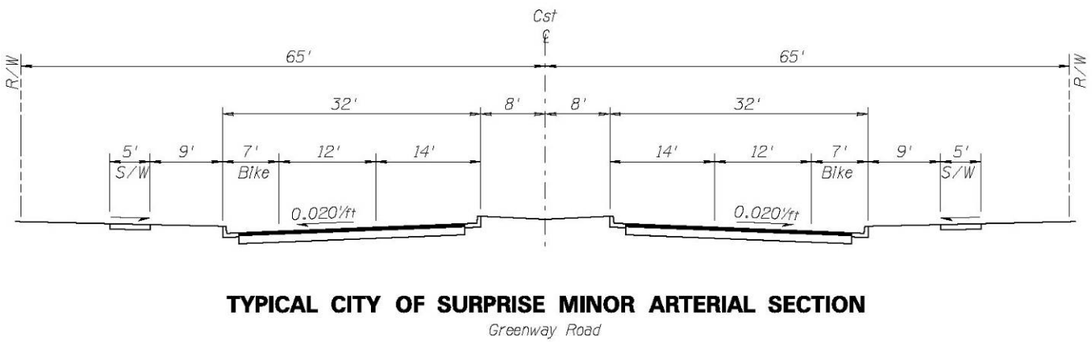

**TYPICAL MCDOT PRINCIPAL ARTERIAL SECTION**
**ROAD OF REGIONAL SIGNIFICANCE***

*Camelback Road*
*Bethany Home Road*
*Glendale Avenue*
*Northern Avenue*
*Olive Avenue**




**TYPICAL CITY OF SURPRISE PRINCIPAL ARTERIAL SECTION**

*Peoria Avenue*
*Cactus Road*
*Waddell Road*
*Bell Road*




**TYPICAL CITY OF SURPRISE MINOR ARTERIAL SECTION**

*Greenway Road*

**Figure 11-3 Principal Arterial Typical Sections**

**Figure 11-4 Minor Arterial Typical Sections**